True North End of Minelife Estimated Reclamation Cost

		Manpower ($)	Equipment ($)	Materials ($)	Totals ($)
1	Roads	$6,124	$11,220	$7,183	$24,527
2	Open Pit	$2,814	$4,018	$3,020	$9,852
3	Rock/Topsoil Dumps	$66,002	$187,665	$21,634	$275,301
4	Ore Stockpile	$15,423	$42,648	$4,206	$62,277
5	Buildings	$2,266	$4,052	$22	$6,339
6	Groundwater Wells	$1,530	$750	$1,190	$3,470
7	Supervisor Supervision	$30,941	$0	$0	$30,941
	SUBTOTAL	$125,100	$250,353	$37,254	$412,707

Mobilization/Demobilization	5% of contract cost	$20,635
Profit	10% of contract cost	$41,271
Sub Total		$474,613
CONTRACT ADMINISTRATION	5% of contract cost	$23,731

$ Cost/Acre by Area					
ROADS	OPEN PIT	ROCK/TOPSOIL DUMPS*	ORE STOCKPILE	BLDGS	WELLS**
$368	$352	$1,415	$1,597	$31,697	$1.43
Total Acres per Area					
66.60	28.00	200.60	39.00	0.20	

* Average cost per/acre for all rock/topsoil dumps.

** $ Cost/foot

Total Cost =	$498,344

Total Acres	Ave. Cost/Acre
334	$1,492

TRUE NORTH RECLAMATION PLAN
Cost Estimation Worksheet:

BASE CASE ASSUMPTIONS (numerical)

Items	Deliver $$/lb.	Applied lb./Acre	Unit Cost/ft.	Operator Wages	Equip. Cost/Hour
Fertilizer	$0.38	100	(fertilizer = 10*20*10 local vender)		
Seed	$6.35	11	(seed mix 50% Arcta Red,20% Tundra Bluegrass,20% Alpine Bluegrass, 10% Hairgrass)		
3/8" Hole Plug(bentonite)	$10.15	per 50 lbs			
Bentseal(bentonite)	$11.35	per 50 lbs			
EZ-MUD	$84.50	per 5 gallons			

	Base Rate	Fringes	FICA 7.65%	SIIS 2.33%	Unemployment 1.3%	Wage Rate	
Laborer	$21.55	$7.08	$2.19	$0.67	$0.37	$31.86	(Davis-Bacon Wage Rates)
Truck Driver	$25.91	$8.06	$2.60	$0.79	$0.44	$37.80	(Davis-Bacon Wage Rates)
Heavy Equipment Operator	$25.91	$8.06	$2.60	$0.79	$0.44	$37.80	(Davis-Bacon Wage Rates)
Dozer Operator	$25.91	$8.06	$2.60	$0.79	$0.44	$37.80	(Davis-Bacon Wage Rates)
Foreman	$27.45	$8.06	$2.72	$0.83	$0.46	$39.52	(Davis-Bacon Wage Rates)

	Equip. Rate		
D10R Cat *	$104.00	pg 21-48	
Motor Grader 163H*	$32.00	pg 21-48	
Broad Spreader-Challenger 35 Tractor*	$20.00	pg 21-48	Major equipment rates based on
Water Truck 20,000 Gal 651E**	$74.00	pg 21-49	Cat equipment handbook (edition 29).
Scraper 657E*	$145.00	pg 21-48	
345 Excavator*	$80.00	pg 21-48	

* All CAT equipment rates are based on average conditions (CPH) with exception to 651E water truck.
** Moderate operating conditions-651E equiped with 20,000 gallon water tank.
_ Motor grader/water truck rates assumed @ 1 Hrs/ac.
_ Foreman rates approx. 1.06 x operator rates.

Foreman Wage Rates	Hours	Foreman*** Labor Cost
$39.52	783	$30,940.66

*** Note: foreman labor cost for the entire project was assumed to equal the piece of equipment with the highest number of operational hours.
It is assumed that multiple tasks shall be conducted simultaneously on the project with need for only one superviser on-site at any given time.
The maximum equipment time of 783 hours was calculated for hauling topsoil to the north rock dump (657E scraper).

TRUE NORTH RECLAMATION PLAN
Cost Estimation Worksheet: OPEN PIT (Final Configuration)

ACRES

Type	Surface Acres	Perimeter Feet	Perimeter Acres
Hindenburg Pit	71.47	8956	20.6
East Pit	8.23	3445	7.9
Totals	80	12401	28
		Total =	28

LABOR HOURS AND COST

Equipment Activity	Man Hours/ Acre	Total Man Hours	Wage Rates	**Labor Costs**
D10R Spread	0.47	13	$37.80	$497
D10R Berm Const.	0.25	7	$37.80	$265
Seed/Fert.	1	28	$37.80	$1,058
Scraper 657E	0	0	$37.80	$0
Grader 163H	0.47	13	$37.80	$497
20,000 Water/651E	0.47	13	$37.80	$497
Total Hrs	2.66	74		**$2,814**

EQUIPMENT HOURS/ACRE AND EQUIPMENT COST

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	**Equip. Costs**
D10R Spread	0.47	13	$104						$1,352
D10R Berm Const.	0.25	7		$104					$728
Seed/Fert.	1	28			$20				$560
Scraper 657E	0	0				$145			$0
Grader 163H	0.47	13					$32		$416
20,000 Water/651E	0.47	13						$74	$962
Total Hrs	2.66	74.00							**$4,018**

MATERIAL COST

Materials	Delivered $$/Pound	Pounds/ Acre		**Materials Cost**
Fertilizer	$0.38	100		$1,064
Seed	$6.35	11		$1,956
			Total	**$3,020**

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$2,814	$4,018	$3,020	$9,852
Cost per Acre:	$101	$144	$108	**$352**

Assumptions:
Portions of open pits will be backfilled during active mining.
Pit perimeter will be reclaimed 100 feet back from the pit rim and bermed (6 ft).
Bermed soil will be taken from 100 foot reclaimed area along pit perimeter.

TRUE NORTH RECLAMATION PLAN

Cost Estimation Worksheet: North Rock Dump

ACRES					
Slope Correction	1.2	(1.2xPlan View Acres)			Actual
		Reclaimed Sloped	Actual Sloped	Reclaimed Flat	Reclaimed Dump
Dump ID		Acres	Acres	Acres	Acres
North Rock Dump		**39.0**	**46.8**	**34.0**	**80.8**
Southeast Rock Dump		39.0	46.8	8.0	54.8
Southwest Rock Dump		50.0	60.0	5.0	65.0
Ore Stockpile		0.0	0.0	39.0	39.0
Total		128.0	153.6	86.0	239.6

North Rock Dump		
Total Man Hours	Wage Rates	Labor Costs
703	$37.80	$26,575
		$26,575

North Rock Dump

Sloped Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Reslope & Spread T	6.96	326	$104						$33,904
D10R Scarify	0.25	12		$104					$1,248
Seed/Fert.	1	47			$20				$940
Scraper 657E	2.08	97				$145			$14,065
Grader 163H	0.52	24					$32		$768
20,000 Water/651E	0.52	24						$74	$1,776
Total Hrs	11.33	530							**$52,701**

North Rock Dump

Flat Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Spread Topsoil	0.68	23	$104						$2,392
D10R Scarify	0.25	9		$104					$936
Seed/Fert.	1	34			$20				$680
Scraper 657E	2.08	71				$145			$10,295
Grader 163H	0.52	18					$32		$576
20,000 Water/651E	0.52	18						$74	$1,332
Total Hrs	5.05	173							**$16,211**

MATERIAL COSTS				
Materials	$$/Pound	Pounds/Acre		Cost of Materials
Fertilizer	$0.38	100		$3,070
Seed	$6.35	11		$5,644
			Total	**$8,714**

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$26,575	$68,912	$8,714	$104,201
Cost per Acre:	$329	$853	$108	$1,290

TRUE NORTH RECLAMATION PLAN

Cost Estimation Worksheet: Southeast Rock Dump

ACRES				
Slope Correction	1.2		(1.077xPlan View Acres)	Actual
	Reclaimed Sloped	Actual Sloped	Reclaimed Flat	Reclaimed Dump
Dump ID	Acres	Acres	Acres	Acres
North Rock Dump	39.0	46.8	34.0	80.8
Southeast Rock Dump	**39.0**	**46.8**	**8.0**	**54.8**
Southwest Rock Dump	50.0	60.0	5.0	65.0
Ore Stockpile	0.0	0.0	39.0	39.0
Total		153.6	86.0	239.6

Southeast Rock Dump		
Total Man Hours	Wage Rates	Labor Costs
539	$37.80	$20,375
		$20,375

Southeast Rock Dump

Sloped Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Reslope & Spread T	6.96	326	$104						$33,904
D10R Scarify	0.25	12		$104					$1,248
Seed/Fert.	1	47			$20				$940
Scraper 657E	1.69	79				$145			$11,455
Grader 163H	0.42	20					$32		$640
20,000 Water/651E	0.42	20						$74	$1,480
Total Hrs	10.74	504							**$49,667**

Southeast Rock Dump

Flat Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Spread Topsoil	0.68	5	$104						$520
D10R Scarify	0.25	2		$104					$208
Seed/Fert.	1	8			$20				$160
Scraper 657E	1.69	14				$145			$2,030
Grader 163H	0.42	3					$32		$96
20,000 Water/651E	0.42	3						$74	$222
Total Hrs	4.46	35							**$3,236**

MATERIAL COSTS			
Materials	$$/Pound	Pounds/Acre	Cost of Materials
Fertilizer	$0.38	100	$2,082
Seed	$6.35	11	$3,828
		Total	**$5,910**

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$20,375	$52,903	$5,910	$79,188
Cost per Acre:	$372	$965	$108	$1,445

TRUE NORTH RECLAMATION PLAN

Cost Estimation Worksheet: Southwest Rock Dump

ACRES

Slope Correction	1.2		(1.077xPlan View Acre		Actual
		Reclaimed Sloped	Actual Sloped	Reclaimed Flat	Reclaimed Dump
Dump ID		Acres	Acres	Acres	Acres
North Rock Dump		39.0	46.8	34.0	80.8
Southeast Rock Dump		39.0	46.8	8.0	54.8
Southwest Rock Dump		**50.0**	**60.0**	**5.0**	**65.0**
Ore Stockpile		0.0	0.0	39.0	39.0
Total			153.6	86.0	239.6

Southwest Rock Dump

Total Man Hours	Wage Rates	Labor Costs
668	$37.80	$25,252
		$25,252

Southwest Rock Dump

Sloped Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Reslope & Spread Topsoil	6.96	418	$104						$43,472
D10R Scarify	0.25	15		$104					$1,560
Seed/Fert.	1	60			$20				$1,200
Scraper 657E	1.71	103				$145			$14,935
Grader 163H	0.42	25					$32		$800
20,000 Water/651E	0.42	25						$74	$1,850
Total Hrs	10.76	646							$63,817

Southwest Rock Dump

Flat Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Spread Topsoil	0.68	3	$104						$312
D10R Scarify	0.25	1		$104					$104
Seed/Fert.	1	5			$20				$100
Scraper 657E	1.71	9				$145			$1,305
Grader 163H	0.42	2					$32		$64
20,000 Water/651E	0.42	2						$74	$148
Total Hrs	4.48	22							$2,033

MATERIAL COSTS

Materials	$$/Pound	Pounds/Acre		Cost of Materials
Fertilizer	$0.38	100		$2,470
Seed	$6.35	11		$4,540
			Total	**$7,010**

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$25,252	$65,850	$7,010	$98,112
Cost per Acre:	$388	$1,013	$108	$1,509

TRUE NORTH RECLAMATION PLAN

Cost Estimation Worksheet: Orestockpile

ACRES					
Slope Correction	1.2	(1.077xPlan View Acres)			Actual
		Reclaimed Sloped	Actual Sloped	Reclaimed Flat	Reclaimed Dump
Dump ID		Acres	Acres	Acres	Acres
North Rock Dump		39.0	46.8	34.0	80.8
Southeast Rock Dump		39.0	46.8	8.0	54.8
Southwest Rock Dump		50.0	60.0	5.0	65.0
Ore Stockpile		**0.0**	**0.0**	**39.0**	**39.0**
Total			153.6	86.0	239.6

Orestockpile		
Total Man Hours	Wage Rates	Labor Costs
408	$37.80	$15,423
		$15,423

Orestockpile

Sloped Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Reslope & Spread Topsoil	6.53	0	$104						$0
D10R Scarify	0.25	0		$104					$0
Seed/Fert.	1	0			$20				$0
Scraper 657E	5.68	0				$145			$0
Grader 163H	1.42	0					$32		$0
20,000 Water/651E	1.42	0						$74	$0
Total Hrs	16.3	**0**							**$0**

Orestockpile

Flat Areas:

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour 657E	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Spread Topsoil	0.68	27	$104						$2,808
D10R Scarify	0.25	10		$104					$1,040
Seed/Fert.	1	39			$20				$780
Scraper 657E	5.68	222				$145			$32,190
Grader 163H	1.42	55					$32		$1,760
20,000 Water/651E	1.42	55						$74	$4,070
Total Hrs	10.45	**408**							**$42,648**

MATERIAL COSTS				
Materials	$$/Pound	Pounds/Acre		Cost of Materials
Fertilizer	$0.38	100		$1,482
Seed	$6.35	11		$2,724
			Total	**$4,206**

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$15,423	$42,648	$4,206	$62,277
Cost per Acre:	$395	$1,094	$108	$1,597

TRUE NORTH RECLAMATION PLAN
Cost Estimation Worksheet: BUILDING and EQUIPMENT SITES

ACRES

Building or Site ID	Foundation Area (sq.')	Site Acres
Maint. Bay 1-3	4,320	0.10
Electircal Bldg.	1,440	0.03
Wash/Aprons	3,000	0.07
	Total =	0.20

LABOR HOURS AND COST

Equipment Activity	Man Hours/ Acre	Total Man Hours	Wage Rates	Labor Costs
375 Excavator*	244.2	48.84	$37.80	$1,846
D10R Reslope**	0.68	3.54	$37.80	$134
D10R Scarify**	0.25	1.30	$37.80	$49
Seed/Fert.**	1	5.20	$37.80	$197
Scraper 657E	3.54	0.71	$37.80	$27
Grader 163H	0.89	0.18	$37.80	$7
20,000 Water/651E	0.89	0.18	$37.80	$7
Total Hrs	251.45	59.94	Total	$2,265.84

*375 excavator mounted with hydraulic hammer
**Includes five additional acres for resloping,scarifying, and seeding/fertilizing at building and explosives sites

EQUIPMENT HOURS/ACRE AND EQUIPMENT COST

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour 375	Equip. $$/Hour D10R	Equip. $$/Hour 657E	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
375 Excavator*	244.2	48.84	$80						$3,907
D10R Reslope	0.68	0.14		$104					$14
D10R Scarify	0.25	0.05		$104					$5
Seed/Fert.	1	0.20			$145				$4
Scraper 657E	3.54	0.71				$20			$103
Grader 163H	0.89	0.18					$32		$6
20,000 Water/651E	0.89	0.18						$74	$13
Total Hrs	251.45	50.29						Total	$4,052

*375 excavator mounted with hydraulic hammer

MATERIAL COST

Materials	Delivered $$/Pound	Pounds/ Acre		Cost of Materials
Fertilizer	$0.38	100		$8
Seed	$6.35	11		$14
			Total	$22

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$2,266	$4,052	$22	$6,339
Cost per Acre:	$11,329	$20,260	$108	**$31,697**

Assumptions:
Buildings and equipment removed for salvage; only foundations remain.
Foundations above grade and concrete floor structures to be broken up with hydraulic hammer and buried in place with dozer.

TRUE NORTH RECLAMATION PLAN
Cost Estimation Worksheet: ROADS

ACRES

Type	Road Length	Road Width	Road Acres
Site Access Roads	29,000	100	66.6
		Totals	66.6

LABOR HOURS AND COST

Equipment Activity	Man Hours/ Acre	Total Man Hours	Wage Rates	Labor Costs
D10R Spread Topsoil	0.68	45	$37.80	$1,701
D10R Scarify	0.75	50	$37.80	$1,890
Seed/Fert.	1	67	$37.80	$2,533
Grader 163H	0	0	$37.80	$0
20,000 Water/651E	0	0	$37.80	$0
Total Hrs	2.43	162	Total	$6,124

EQUIPMENT HOURS/ACRE AND EQUIPMENT COST

Equipment Activity	Equip. Hours/ Acre	Total Equip. Hours	Equip. $$/Hour D10R	Equip. $$/Hour Seed/Fert.	Equip. $$/Hour Grader 163H	Equip. $$/Hour 20,000 Water/651E	Equip. Costs
D10R Spread Topsoil	0.68	45	$104				$4,680
D10R Scarify	0.75	50	$104				$5,200
Seed/Fert.	1	67		$20			$1,340
Grader 163H	0	0			$32		$0
20,000 Water/651E	0	0				$74	$0
Total Hrs	2.43	162				Total	$11,220

MATERIAL COST

Materials	Delivered $$/Pound	Pounds/ Acre	Cost of Materials
Fertilizer	$0.38	100	$2,531
Seed	$6.35	11	$4,652
		Total	$7,183

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$6,124	$11,220	$7,183	$24,527
Cost per Acre:	$92	$168	$108	**$368**

Assumptions:
Road widths nominal from toe of fill to crest of cut.
Scarified road surfaces will provide suitable growth medium.
D10R dozer time (spreading topsoil) is attributed to recontouring any bermed material along access roads.

TRUE NORTH RECLAMATION PLAN

Cost Estimation Worksheet: Groundwater Wells 5" well = 0.136 ft3/Lf

Groundwater Wells

Well ID	Depth Length (ft)	Well Dia. (in)	Required Well* Vol.(1.02 gal/ft)	Required 50# Bags Benseal (50#/30 gal)	Required Gals EZ MUD Benseal (10 oz/30 gal)
TMW-1	190	5	194	6	65
TMW-2	330	5	337	11	112
TMW-3	360	5	367	12	122
TMW-4	220	5	224	7	75
TMW-5	150	5	153	5	51
TMW-6	350	5	357	12	119
TMW-7	460	5	469	16	156
TMW-8	307	5	313	10	104
TMW-9	60	5	61	2	20
Totals	2,427		Total	81	6.45

* Manufacturer's recommendation for required benseal slurry per foot (5" well).

LABOR HOURS AND COST

Equipment Activity	Man Hrs/ 100 ft	Total Man Hours	Wage Rates	Labor Costs
Laborer (1)	1	24	$31.86	$765
Laborer (2)	1	24	$31.86	$765
Total Hrs	2	48	**Total**	**$1,530**

EQUIPMENT COST

Equipment Activity	Equip. $$/Day	Equip. # Days	Equip. Costs
4WD Flat bed Truck	$150	3	$450
Pump/mixing Equipment	$100	3	$300
		Total	**$750**

MATERIAL COST

Materials	Delivered $$/BAG	Cost of Materials	
3/8" Hole Plug(bentonite)	$10.15	$102	
Benseal(bentonite)	$11.35	$919	
EZ-MUD	$84.50	$169	(2-5 Gal containers)
	Total	**$1,190**	

	Manpower	Equipment	Materials	Total
GRAND TOTALS:	$1,530	$750	$1,190	$3,470
Cost per ft:	$0.63	$0.31	$0.49	**$1.43**

Assumptions:

Groundwater wells are to be filled by tremieing with benseal/ez-mud slurry.

Groundwater wells to be plugged with 3/8' hole plug at surface after well casing removal.

GENERAL ASSUMPTIONS

Hydraulic Hammer Model H180 Cat Performance Handbook Ed29(CPH) pg 18-8

Work:Breaking up concrete foundations and slab floors.

Assumptions: 1)concreete compressive strenght = 3,000 psi
2)correction factors apllied are listed below

	Ave Opr	Job Eff.
Production correction factors	0.75	0.83

3)assume massive formations-F (pg 18-8)
4)Model H180 mounted on excavator-production rates @3000 psi concrete, pg 18-8 = 110 yd3/8Hr
5)concrete floors and concrete foundation walls above final grade shall be broken
6)assume foundation walls are an average of 4 feet above grade
7)assume concrete floors are an average of 1 foot thick

Site	Concrete Volume YD3		Hrs
Shop Complex	324	(includes concrete floors maint bays 1-3, elect. Bldg, & wash/aprons)	37.85
	94	(includes foundation walls)	10.98
		Total	48.83

Hrs = (324yd3/(110yd3/8hr*0.75*0.83))*8 = 37.85

Acres = 0.2 Hammer Production Rate = 110 yd3/8hr

Production	Hrs/Acre	
Hydraulic Hammer'=	**244.20**	(48.84 hrs/0.2 acres)

GENERAL INFORMATION

Reclamation slope 2.5H:1V			6" Topsoil =	807	yd3/Ac
Active rock dump slope 1.5H:1V					
Angle of repose					
Rock Density	3500	#/yd3			
Soil Density	2460	#/yd3			
Production Density	2300	#/yd3			
Slope Acre Correction		1.2			

Dozer Production D10R with SU Blade pg 1-51 Cat Performance Handbook Ed29(CPH) — Density pg1-49 (CPH)
Dozer Track Type — Factor = (2300 lbs/yd3/3500 lbs/yd3) = 0.65
Work:Pushing down bench crests from 1.5:1 to 2.5:1 slope
Assumptions: 100 foot average push

	Ave Opr	Rock	Job Eff.	Grade Eff.	Slot Dozing	Density Factor	D10R pg 1-57 (yd3/hr)
Production correction factors:	0.75	0.7	0.83	1.6	1.2	0.65	1700
Rock Dumps Material/ac	6039.4	yd3/ac					

D10R Production = 924.49 LCY/Hr = (0.75*0.7*0.83*1.6*1.2*0.65*1700) = 924.49

D10R Production = 6.53 (Hrs/Ac) — D10R Prod. = (6,039.4yd3/ac/924.49 LCY/Hr) = 6.53

Dozer Production D10R with SU Blade pg 1-51 Cat Performance Handbook Ed29(CPH) — Density pg1-49 (CPH)
Dozer Track Type — Factor = (2300 lbs/yd3/2460 lbs/yd3) = 0.93
Work:Pushing and contouring 6" topsoil over 2.5:1 slope
Assumptions: 6" topsoil layer

	Ave Opr	Topsoil	Job Eff.	Grade Eff.	Density Factor	D10R pg 1-57 (yd3/hr)
Production correction factors:	0.75	1.2	0.83	1.6	0.93	1700
6" Topsoil Material/ac	807	yd3/ac				

D10R Production = 1889.61 LCY/Hr = (0.75*1.2*0.83*1.6*0.93*1700)

D10R Production = 0.43 Hrs/Ac (Hrs/Ac) — D10R Prod. = (807yd3/ac/1889.61 LCY/Hr) = 0.43

Dozer Production D10R with SU Blade pg 1-51 Cat Performance Handbook Ed29(CPH)
Dozer Track Type
Work:Pushing and contouring 6" topsoil over flat slope
Assumptions: 6" topsoil layer

	Ave Opr	Topsoil	Job Eff.	Density Factor	D10R pg 1-57 (yd3/hr)
Production correction factors:	0.75	1.2	0.83	0.93	1700
6" Topsoil Material/ac	807	yd3/ac			

D10R Production = 1181.01 LCY/Hr = (0.75*1.2*0.83*0.93*1700)

D10R Production = 0.68 Hrs/Ac (Hrs/Ac) — D10R Prod. = (807yd3/ac/1181.01 LCY/Hr) = 0.68

Dozer Production D10R with SU Blade pg 1-51 Cat Performance Handbook Ed29(CPH)
Dozer Track Type
Work:Reclamation along pit perimeter
Assumptions: 1) 100 foot width section reclaimed
2) Berm to be established along pit perimeter approx. 6 feet high
3) Berm material to be obtained from reclaimed area along pit perimeter
4) Dozer average run = 100 foot

Berm Area = (0.5*7.8*6)*2 = 46.8 sq. ft
Berm Volume = (46.8 sq.ft)(1 ft)/27 = 1.73 yd3/Lf
Pit Perimeter Distance = 12401 Lf
Pit Perimeter Volume = 15493.88 yd3
Material/Acre (15,494 yd3/28 ac) = 553 yd3/ac

	Ave Opr	Topsoil	Job Eff.	Density Factor	D10R pg 1-57 (yd3/hr)
Production correction factors	0.75	1.2	0.83	0.93	1700

D10R Production = 1181.01 LCY/Hr = (0.75*1.2*0.83*0.93*1700)

D10R Production = 0.47 Hrs/Ac (Hrs/Ac) — Pit Perimeter — D10R Prod. = (553yd3/ac/1181.01 LCY/Hr) = 0.47

Dozer Production D10R with Multishank Adjustable Parallelogram Ripper
Dozer Track Type
Work:Scarifying with rippers
Assumptions: 1)ripping in 1st gear-2.5 mph, offset ripping
2)scarifying 6' topsoil
3)scarifying/ripping road surfaces will require 3 passes to rip
Shank Gauge 8' 8"

2 Pass Ripper Width = 12.99 ft — 1st gear speed 13200 ft/hr

D10R Production = 0.25 Hrs/Ac (Hrs/Ac) — Topsoil Rippig Rate

D10R Production = 0.75 Hrs/Ac (Hrs/Ac) — Road Ripping Rate

Seeding/Fertilizing Production

Work:Seeding and Fertilizing

Assumptions:
1)Challenger 35 Tractor CAT Performance Handbook pg 2-6 (CPH)
2)Seed and fertilizer are to be broadcasted with 12 volt mounted broadcaster
3)Spreading rates = 1st gear speed = 1.6 mi/hr = 8448 ft/hr
4)Single run spread widths: Seed = 8 ft, Fertilizer = 20 ft

Seeding Width =	8	ft	1st gear speed	8448	ft/hr
Fertilizer Width =	20	ft			

Seeding Production =	0.64	Hrs/ac	(43,560/(8x8448))
Fertilizing Production =	0.26	Hrs/ac	(43,560/(20x8448))

Challenger 35 Seeding/Fertilizer Production = (Hrs/Ac)	**1**	**Hrs/Ac**

GENERAL ASSUMPTIONS

Reclamation slope 2.5H:1V			6" Topsoil =	807	yd3/Ac
Angle of repose 1.3H:1V			12" Topsoil =	1614	yd3/Ac
Production Density	3000	#/yd3			
Soil Density	2460	#/yd3			
Slope Acre Correction		1.077			

Scraper Production 657E pg 8-3 Cat Performance Handbook Ed29(CPH)
Capacity 34.6 yd3 pg 8-71 CPH
Work:Scraping and hauling topsoil at topsoil/southwest rock dump

Assumptions: 1)maximum haul road grades are 8 %
2)correction factors apllied are listed below

	Ave Opr	Job Eff.	Density Factor
Production correction factors:	0.75	0.83	1.22

3)haul distances are average
4)topsoil supplied from southwest topsoil/rock dump area
5)6" topsoil layer

		Acres	%
Southwest Rock Dump	Flat	5	8.49
	Sloped	53.9	91.51
		58.9	

Southwest Rock Dump
Ave Haul Dist.
1435 feet (borrow area)

Ave Haul Dist.
0 feet

	Feet	% Grade
Southwest Rock Dump	1435	8.00
	0	0
	1435	

Southwest Rock Dump 1435 @ 8.00 pg 8-71 (CPH)
Production Approx. = 620 yd3/hr

657E yd3/Hr
Production = 470.86 = (0.75*0.83*1.22*620)

657E **Southwest Rock Dump**
Production = **1.71** **Hrs/Ac**
(Hrs/Ac)

657E Prod. = (807yd3/ac/470.86 LCY/Hr) = 1.71

Scraper Production 657E pg 8-3 Cat Performance Handbook Ed29(CPH)
Capacity 34.6 yd3 pg 8-71 CPH
Work:**Scraping and hauling topsoil at southeast topsoil/rockdump**

Assumptions:
1)maximum haul road grades are 8 %
2)correction factors apllied are listed below

	Ave Opr	Job Eff.	Density Factor
Production correction factors:	0.75	0.83	1.22

3)haul distances are average
4)topsoil supplied from southeast topsoil/rock dump area
5)6" topsoil layer

		Acres	%
Southeast topsoil	Flat	7.6	16.45
	Sloped	38.6	83.55
		46.2	

Ave Haul Dist.
0 feet (borrow area)
0
Southeast topsoil/rock dump
Ave Haul Dist.
1425 feet

	Feet	% Grade
Southeast topsoil/rock dump	1425	8
	0	8
	1425	

Southeast topsoil/rock dump 1425 @ 8.00 pg 8-71 (CPH)
Production Approx. = 630 yd3/hr

657E yd3/Hr
Production = 478.45 = (0.75*0.83*1.22*630)

657E	Southeast Topsoil/Rock Dump			
Production = (Hrs/Ac)	**1.69**	**Hrs/Ac**	657E Prod. =	(807yd3/ac/478.26 LCY/Hr) = 1.69

Scr ber Production 657E pg 8-3 Cat Performance Handbook Ed29(CPH)
Cap city 34.6 yd3 pg 8-71 CPH
Wo :Scraping and hauling topsoil at north topsoil/rock dump
Ass mptions: 1)maximum haul road grades are 8 %
2)correction factors apllied are listed below

	Ave Opr	Job Eff.	Density Factor
Pro ction correction factors:	0.75	0.83	1.22

3)haul distances are average
4)topsoil supplied from north topsoil/rock dump
5)6" topsoil layer

		Acres	%
Nort rock dump	Flat	73.4	65.13
	Sloped	39.3	34.87
		112.7	

Nort rock dump
Ave aul Dist.
1986 feet (north dump area)

	Feet	% Grade	100 ft sections
Nort rock dump	1986	8.00	
	0	8	
	1986		

Nort rock dump 1986 @ 8.00 pg 8-71 (CPH)
Production Approx. = 510 yd3/hr

657E yd3/Hr
Prod ction = 387.32 = (0.75*0.83*1.22*510)

657E **North Rock Dump**
Prod ction = **2.08** **Hrs/Ac**
(Hrs Ac)

657E Prod. = (807yd3/ac/387.32 LCY/Hr) = 2.08

Scr ber Production 657E pg 8-3 Cat Performance Handbook Ed29(CPH)
Cap city 34.6 yd3 pg 8-71 CPH
Wor k:Scraping and hauling topsoil from southeast topsoil stockpile to orestockpile
Ass mptions: 1)maximum haul road grades are 8 %
2)correction factors apllied are listed below

	Ave Opr	Job Eff.	Density Factor
Pro ction correction factors:	0.75	0.83	1.22

3)haul distances are average
4)topsoil supplied from southeast topsoil/rock dump
5)6" topsoil layer

		Acres	%
Ore ockpile	Flat	49	100.00
	Sloped	0	0.00
		49	

Ore ockpile
Ave aul Dist.
1650 feet (orestockpile area)
2450 feet (haul rd from southeast topsoil/rockdump to orestockpile area)

Sou east topsoil/rock dump
Ave aul Dist.
1425 feet

	Feet	% Grade
Ore ockpile	4100	8.00
Sou east topsoil/rock dump	1425	8
	5525	

pg 8-71 (CPH)

Ore ockpile 5525 @ 8.00 Production Approx. = 187 yd3/hr (8%)
Production rate was extrapolated from graph on pg 8-71(CPH)
y(6%) = -324.03Ln(x)+3042.5 = 250.32 yd3 x = 5,525
y(10%) = -339.33Ln(x)+3048.6 = 123.58 yd3

657E yd3/Hr
Prod ction = 142.02 = (0.75*0.83*1.22*187)

657E	Orestockpile			
Prod ction = (Hrs Ac)	**5.68**	**Hrs/Ac**	657E Prod. =	(807yd3/ac/142.02 LCY/Hr) = 5.68

Scraper Production 657E pg 8-3 Cat Performance Handbook Ed29(CPH)
Capacity 34.6 yd3 pg 8-71 CPH
Work:Scraping and hauling topsoil from southeast topsoil stockpile to maintenance complex
Assumptions: 1)maximum haul road grades are 8 %
2)correction factors apllied are listed below

	Ave Opr	Job Eff.	Density Factor
Production correction factors:	0.75	0.83	1.22

3)haul distances are average
4)topsoil supplied from southeast topsoil/rock dump
5)6" topsoil layer

		Acres	%
Maintenance complex	Flat	0.2	100.00
	Sloped	0	0.00
		0.2	

Maintenance complex
Ave Haul Dist.
365 feet
2450 feet (southeast topsoil/rock haul road to maintenance complex)

Southeast Topsoil/rock dump
Ave Haul Dist.
1425 feet

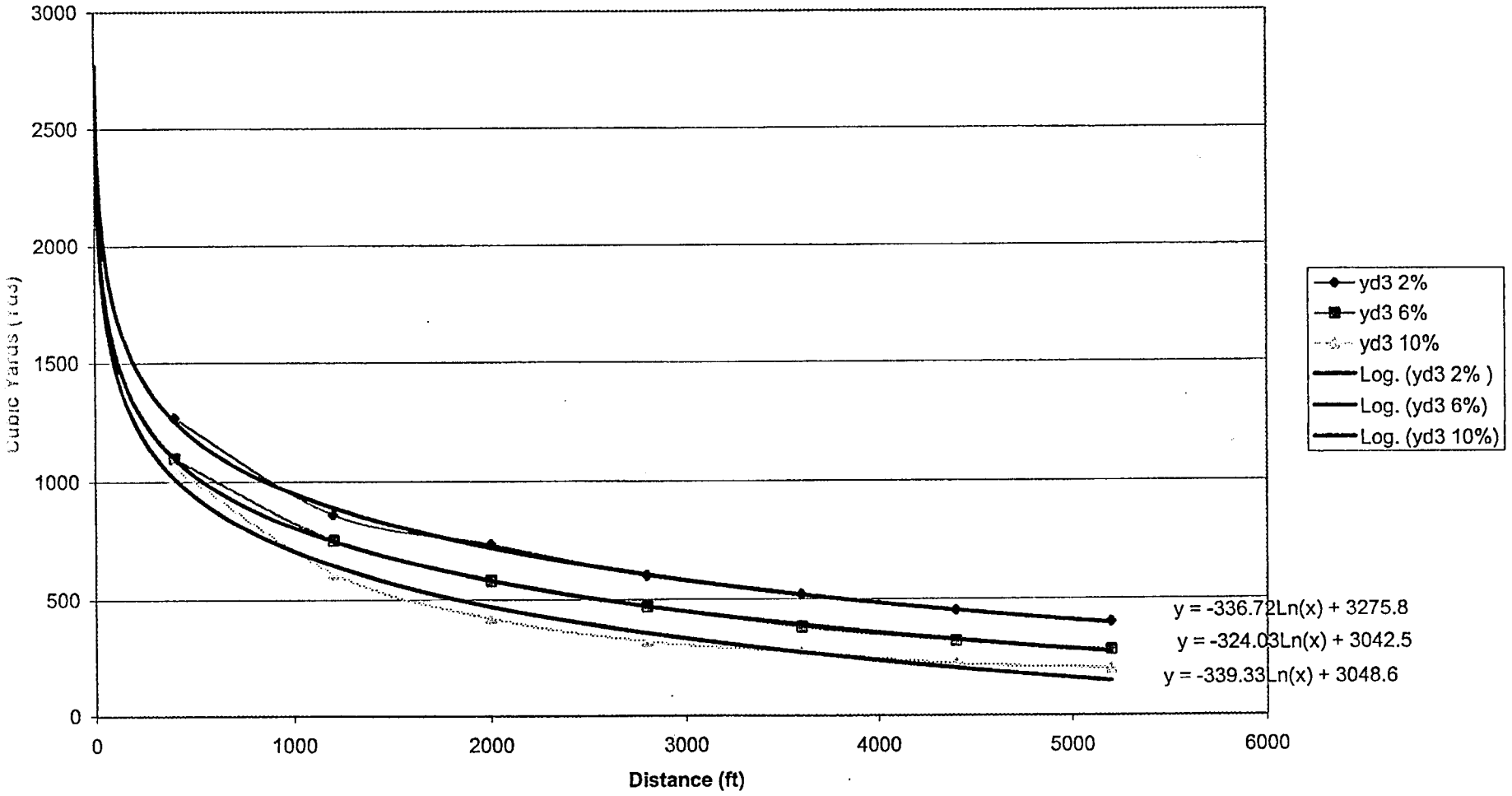
	Feet	% Grade
Maintenance complex	2815	8.00
Barnes Creek Topsoil	1425	8
	4240	

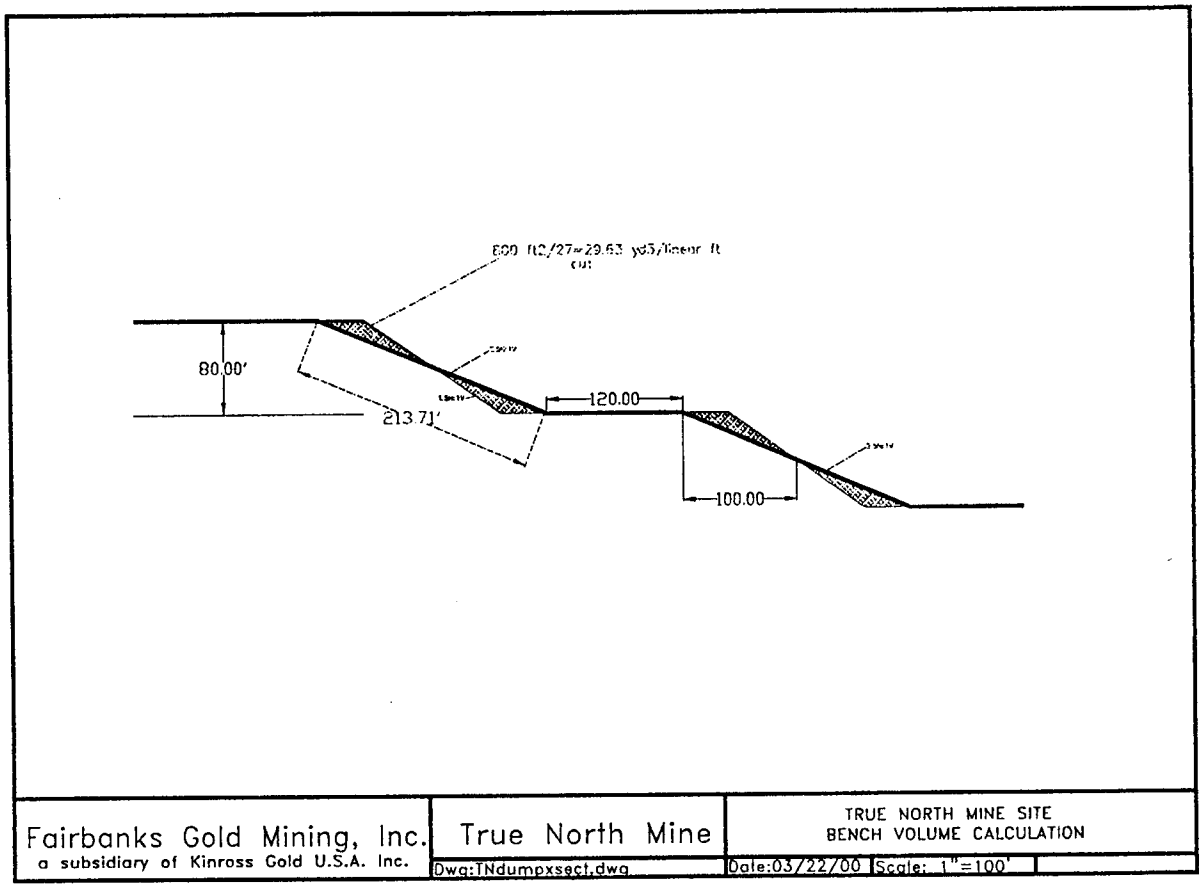
Mill complex 4240 @ 0.00 pg 8-71 (CPH)
Production Approx. = 300 yd3/hr

657E yd3/Hr
Production = 227.84 = (0.75*0.83*1.22*300)

657E	Maintenance complex			
Production = (Hrs/Ac)	**3.54**	**Hrs/Ac**	657E Prod. =	(807yd3/ac/227.74 LCY/Hr) = 3.54

657E Wheel Tractor Production





Volume/Acre = 29.63 yd3/Lf = 29.63 yd3/213.71 ft2

43560 ft2/213.71 ft2 = 203.83

203.83*29.63 = **6,039.4 yd3/Ac**

Approximate Topsoil Volume Requirements

Ass mptions: all topsoil stripped will be stockpiled at each respective topsoil/rock dump.

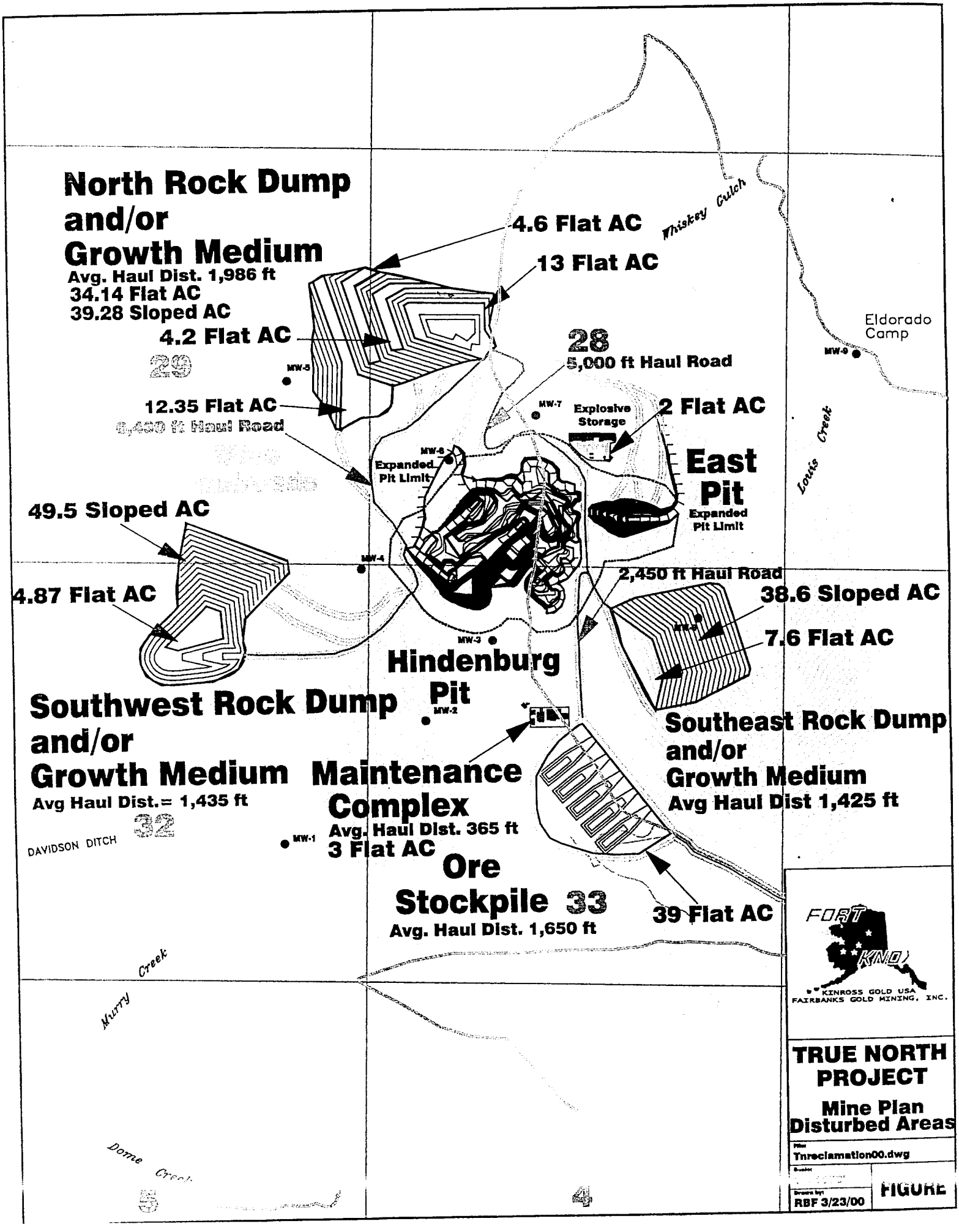
	ROADS	PIT	DUMPS/ORE STOCKPILE	BUILDINGS
Acres	67	28	240	0.20
T psoil Requirements yd3 @ 807 yd3/ac (6" soil cover)	0	0	193,680	161

Total Topsoil Requirements (yd3)
193,841

Potential Topsoil Volumes

Site	Area (acres)	Soil Depth (ft)	Volume (cy)	
Sou heast topsoil/rock dump (Louis Creek)*	54.8	1.42	125,543	
No h topsoil/rock dump (Spruce Creek)*	80.8	1.31	170,768	
Sou hwest topsoil/rock dump**	65	0.5	52,433	
Total Potential			**348,745**	yd3

* De th based on exploration drill borehole data by Golder Associates.
* Sc depth was calculated by averaging organic depth for all drillholes within the proposed dump limits.
** S depth was conservatively estimated to be 0.5 ft thick based on field boreholes (Louis and Spruce Creeks).


North Rock Dump
and/or
Growth Medium
Avg. Haul Dist. 1,986 ft
34.14 Flat AC
39.28 Sloped AC
4.6 Flat AC
13 Flat AC
4.2 Flat AC
29
MW-5
12.35 Flat AC
6,400 ft Haul Road
28
5,000 ft Haul Road
MW-7
Explosive Storage
2 Flat AC
MW-6
Expanded Pit Limit
East Pit
Expanded Pit Limit
Whiskey Gulch
Eldorado Camp
MW-9
Louis Creek
49.5 Sloped AC
4.87 Flat AC
MW-4
2,450 ft Haul Road
38.6 Sloped AC
7.6 Flat AC
MW-8
MW-3
Hindenburg Pit
MW-2
Southwest Rock Dump
and/or
Growth Medium
Avg Haul Dist.= 1,435 ft
32
DAVIDSON DITCH
MW-1
Maintenance Complex
Avg. Haul Dist. 365 ft
3 Flat AC
Southeast Rock Dump
and/or
Growth Medium
Avg Haul Dist 1,425 ft
Ore Stockpile 33
Avg. Haul Dist. 1,650 ft
39 Flat AC
Murry Creek
Dome Creek
5
4
FORT KNOX
KINROSS GOLD USA
FAIRBANKS GOLD MINING, INC.
TRUE NORTH PROJECT
Mine Plan Disturbed Areas
File: Tnreclamation00.dwg
Drawn by: RBF 3/23/00
FIGURE